

AD-A119 100

AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH
A PHOTOCHEMICAL STUDY OF THE KINETICS OF THE REACTIONS OF NH₂ W--ETC(U)

F/0 20/5

UNCLASSIFIED

JUN 82 S R BOSCO

AFIT/CI/NR/82-380

NL

3 OF 3
AD-4
119100



END
DATE
FILMED
10-82
DTIC

(29) G. Herzberg, "Electronic Spectra and Electronic Structure of Polyatomic Molecules," D. Van Nostrand Co., Inc., Princeton, New Jersey, 1967, p. 609.

(30) K. Watanabe, J. Chem. Phys., 22, 1564 (1954).

(31) G. Herzberg, "Electronic Spectra and Electronic Structure of Polyatomic Molecules," D. Van Nostrand Co., Inc., Princeton, New Jersey, 1967, p. 458.

(32) H. Okabe, "Photochemistry of Small Molecules," John Wiley & Sons, New York, 1978, p. 269.

(33) J. R. McNesby and H. Okabe, in "Advances in Photochemistry," Vol III, W. A. Noyes Jr, G. S. Hammond, J. N. Pitts, Editors, John Wiley & Sons, Inc., New York, 1964, pp. 195-203.

(34) H. Okabe, and M. Lenzi, J. Chem. Phys., 47, 12, 5241 (1967).

(35) W. E. Groth, U. Schurath, R. N. Schindler, J. Phys. Chem., 72, 3914 (1968).

(36) H. Okabe, "Photochemistry of Small Molecules," John Wiley & Sons, New York, 1978, pp. 269-272.

(37) *ibid.*, p. 270.

(38) G. Herzberg, "Electronic Spectra and Electronic Structure of Polyatomic Molecules," D. Van Nostrand Co., Inc., Princeton, New Jersey, 1967, p. 504.

(39) J. Manaset, J. Fournier, C. Vermeil, Can. J. Chem., 51, 17, 2946 (1973).

(40) G. Herzberg, G., "Electronic Spectra and Electronic Structure of Polyatomic Molecules," D. Van Nostrand Co., Inc., Princeton, New Jersey, 1967, p. 584.

(41) K. Dressler and D. A. Ramsay, Phil. Trans. R. Soc., A251, 553 (1959).

(42) M. Lenzi and J. R. Mc Nesby, A. Mele, C. N. Xuan, J. Chem. Phys., 57, 1, 329 (1972).

(43) M. Kroll, J. Chem. Phys., 63, 1, 320 (1975).

(44) G. Hancock, W. Lange, M. Lenzi, K. H. Welge, Chem. Phys. Lett., 33, 1, 168 (1975).

(45) R. Lesclaux and P. Van Khe, 12th Informal Conf. on Photochemistry, p. 3-1 (1976).

(46) W. Hack, H. Schacke, M. Schröter, H. Gg. Wagner, 17th Symposium on Combustion, p. 505 (1979).

(47) L. J. Stief, D. F. Nava, W. D. Brobst, R. P. Borkowski, J. V. Michael, Trans. Far. Soc. II, (in press) (1982).

(48) a. M. H. Hanes and E. J. Bair, J. Chem. Phys., 38, 672 (1963).
b. R. W. Diesen, J. Chem. Phys., 39, 2121 (1963).
c. J. D. Salzmann and E. J. Bair Jr, J. Chem. Phys., 41, 3654 (1964).
d. K. A. Mantei and E. J. Bair Jr, J. Chem. Phys., 49, 3248 (1968).
e. M. Gehring, K. Hoyermann, H. Gg. Wagner, J. Wolfrum, Ber. Bunsenges Phys. Chem., 75, 1278 (1971).

(49) S. Gordon, W. Mulac, P. Nangia, J. Phys. Chem., 75, 2087 (1971).

(50) P. Van Khe, J. C. Soulignac, R. Lesclaux, J. Chem. Phys., 61, 3, 210 (1977).

(51) P. Van Khe, R. Lesclaux, J. Chem. Phys., 73, 9 (1979).

(52) M. Demissey, "Etude de la Reactivite du Radical NH_2 avec les Alcanes et les Radicaux Alkyles," (Ph.D. Dissertation, Univ. of Bordeaux, 1979) p. 80.

(53) J. W. Buchanan and R. J. Hanrahan, Rad. Res., 44, 296 (1970).

(54) S. Benson, "The Foundations of Chemical Kinetics", McGraw Hill Book Co., Inc., New York, 1960, p. 67.

(55) J. J. Hood, *Phil. Mag.*, 6, 371 (1878).

(56) J. H. van't Hoff, "Etudes de Dynamic Chimique", F. Müller & Co., Amsterdam (1884).

(57) S. Arrhenius, *Z. Physik. Chem.*, 4, 226 (1889).

(58) S. Glasstone, "Textbook of Physical Chemistry", D. Van Nostrand Co., Inc., Princeton, New Jersey, 1940, p. 194.

(59) R. E. Huie and J. T. Herron, *Progress in Reaction Kinetics*, Vol. 8, Edited by K. R. Jennings and R. B. Cundall, Pergamon Press, New York, 1978, p. 1.

(60) C. J. Howard, *J. Phys. Chem.*, 83, 1, 3 (1979).

(61) J. V. Michael and J. H. Lee, *J. Phys. Chem.*, 83, 1, 11 (1979).

(62) R. G. W. Norrish and G. Porter, *Nature*, 164, 658 (1949).
G. Porter, *Proc. R. Roy. Soc. (Lond.)*, A200, 284 (1950).

(63) D. N. Bailey and D. M. Hercules, *J. Chem. Ed.*, 42, 2 (1965).

(64) R. B. Klemm and L. J. Stief, *J. Chem. Phys.*, 61, 11, 4900 (1974).

(65) a. K. H. Kley and K. H. Welge, *Z. Naturforsch.*, 20a, 124 (1965).
b. K. Watanabe, *J. Chem. Phys.*, 22, 1564 (1954).
c. K. Watanabe, *J. Chem. Phys.*, 40, 558 (1964).

(66) H. Okabe, "Photochemistry of Small Molecules," John Wiley & Sons, New York, 1978, p. 271.

(67) G. H. Atkinson, *J. Chem. Phys.*, 59, 1, 350 (1973).

(68) M. Kroll, *J. Chem. Phys.*, 63, 1, 320 (1975).

(69) G. M. Barrow, "Introduction to Molecular Spectroscopy", McGraw Hill Book Co., Inc., New York, 1962, p. 70.

(70) H. Okabe, "Photochemistry of Small Molecules," John Wiley & Sons, New York, 1978, pp. 108, 117.

(71) Spectra-Physics Instruction Manual, Issue A/375, Spectra Physics Inc., Mountain View, California, 1975, p. 13.

(72) *ibid.* p. 25.

(73) J. B. Halpern, G. Hancock, M. Lenzi, and K. H. Welge, *J. Chem. Phys.*, 63, 11, 4808 (1975).

(74) W. J. Youden, "Statistical Methods for Chemists", John Wiley & Sons, New York, 1951, pp. 42-44.

(75) D. R. Stull, *Industrial and Engineering Chem.*, 39, 517 (1947).

(76) "Matheson Gas Data Handbook", 5th Ed., W. Braker and A. L. Mossman, Editors, Matheson Gas Products Co., E. Rutherford, New Jersey, 1971, p. 17.

(77) *ibid.* p. 477.

(78) *ibid.* p. 1.

(79) J. G. Calvert and J. N. Pitts Jr, "Photochemistry", John Wiley and Sons, Inc., New York, 1966, p. 720.

(80) H. Okabe, "Photochemistry of Small Molecules," John Wiley & Sons, New York, 1978, p. 120.

(81) J. H. Lee, J. V. Michael, W. A. Payne, and L. J. Stief, *J. Chem. Phys.*, 68, 4, 1817 (1978).

(82) M. Demissey, "Etude de la Reactivite du Radical NH_2 avec les Alcanes et les Radicaux Alkyles," (Ph. D. Dissertation, Univ. of Bordeaux, 1979) p. 61.

(83) H. Adachi, N. Basco, and D. G. L. James, *Int. J. Chem. Kin.*, XI, 995 (1979).

(84) S. Benson, "Thermochemical Kinetics," John Wiley and Sons, Inc., New York, 1968, p. 104.

(85) S. Shih, R. J. Buenker, S. D. Peyerimhoff, and C. J. Michejda, *J. Am. Chem. Soc.*, 94, 22, 7620 (1972).

(86) S. Benson, "Thermochemical Kinetics," John Wiley and Sons, Inc., New York, 1968, p. 106.

(87) *ibid.* p. 103.

(88) R. Foon and M. Kaufman, *Progress in Reaction Kinetics*, Vol. 8, Edited by K. R. Jennings and R. B. Cundall, Pergamon Press, New York, 1978, p. 81.

(89) W. A. Payne and L. J. Stief, *J. Chem. Phys.*, 64, 3, 1150 (1976).

(90) S. Benson, "Thermochemical Kinetics," John Wiley and Sons, Inc., New York, 1968, pp. 195-204.

(91) *ibid.* p. 22.

(92) J. V. Michael, D. F. Nava, R. P. Borkowski, W. A. Payne, and L. J. Stief, *J. Chem. Phys.*, 73, 12, 6108 (1980).

(93) S. Benson, "Thermochemical Kinetics," John Wiley and Sons, Inc., New York, 1968, p. 22.

(94) J. H. Lee, J. V. Michael, W. A. Payne, D. A. Whytock, and L. J. Stief, *J. Chem. Phys.*, 65, 8, 3280 (1976).

(95) M. Gehring, K. Hoyerman, H. Schacke, J. Wolfrum, *14th Symp. on Comb.*, 99 (1973).

(96) K. J. Laidler, "Theories of Chemical Reaction Rates", McGraw Hill, New York, 1969, p. 83.

(97) J. E. Huheey, "Inorganic Chemistry, Principles of Structure and Reactivity", 2nd Ed., Harper and Row, New York, 1978, pp. 842-850.

(98) D. F. Strobel, private communication.

(99) L. Pauling, *J. Am. Chem. Soc.*, 69, 542 (1947).

(100) G. Herzberg, "Electronic Spectra and Electronic Structure of Polyatomic Molecules," D. Van Nostrand Co., Inc., Princeton, New Jersey, 1967, p. 610.

- (101) H. S. Johnston, "Gas Phase Reaction Rate Theory", Ronald Press Co., New York, 1966, pp. 339-340.
- (102) *ibid.* p. 82.
- (103) *ibid.* p. 81.
- (104) *ibid.* p. 59.
- (105) *ibid.* p. 74.
- (106) *ibid.* p. 28.
- (107) J. E. Huheey, "Inorganic Chemistry, Principles of Structure and Reactivity", 2nd Ed., Harper and Row, New York, 1978, p. 839.
- (108) *ibid.* Appendix F.
- (109) H. S. Johnston, "Gas Phase Reaction Rate Theory", Ronald Press Co., New York, 1966, p. 125.
- (110) S. Benson, "The Foundations of Chemical Kinetics," McGraw Hill Book Co., New York, 1960, p. 202.
- (111) *ibid.* p. 204.
- (112) *ibid.* p. 205.
- (113) H. S. Johnston, "Gas Phase Reaction Rate Theory", Ronald Press Co., New York, 1966, pp. 226-228.

